

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A digital television receiver comprising:
 - an antenna receiving channel signals of digital television broadcasting and having a directionality dependent on a control signal;
 - a signal processing part tuning a wanted channel signal from the channel signals and processing the tuned channel signal as a wanted form;
 - a detection part detecting state signals of the channel signal outputted from the signal processing part, wherein the state signals include a power of the channel signal, a power of a ghost signal, and a signal vs. noise ratio;
 - a memory, when every new state signal is detected, storing ~~the~~ a detected new state signal sorted with previously-detected state signals;
 - a control part producing the control signal corresponding to an optimal direction of the antenna by comparing the new state signal to the previous state signals; and
 - an interface part providing the antenna with the control signal,
wherein the control part comprises:
 - a signal power tracker tracking a power of the tuned channel signal using an output signal of a signal power detector;
 - a ghost power tracker tracking a power of the ghost signal using an output signal of a ghost power detector;

a signal vs. noise ratio (SNR) tracker tracking the signal vs. noise ratio using an output of a signal vs. noise ratio calculator;

a tracking processor tracking states of the tuned channel signal using output signals of the trackers in a presently-selected antenna pattern and then changing the antenna pattern in order stored in the memory if the tracked states fail to maintain effective value sizes;

a scan processor attaining an effective signal power and antenna pattern by varying the directionality of the antenna using an output signal of the tracking processor and then storing the power and pattern values in the memory; and

a sort processor aligning the stored antenna pattern values in order of the signal power values.

2. (Original) The digital television receiver of claim 1, wherein the antenna includes a smart antenna.

3. (Currently Amended) The digital television receiver of claim 1, wherein the signal processing part comprising comprises:

a tuner tuning a wanted channel signal from channel signals received through the antenna;

an intermediate frequency automatic gain control part controlling automatically an intermediate frequency gain of the channel signal tuned by the tuner; and

a receive chip taking a signal having a wanted form from an output signal of the intermediate frequency automatic gain control part and providing the detection part with the taken signal.

4. (Currently Amended) The digital television receiver of claim 3, wherein the receive chip is a VSB (Vestigial Side Band) receive chip for getting a VSB (~~vestibal~~) signal.

5. (Currently Amended) A digital television receiver comprising:
an antenna having a directionality according to a control signal;
a signal processing part making a digital television channel signal from the antenna have a signal of a predetermined form;

a detection part attaining state signals from an output signal of the signal processing part, wherein the state signals include a power of the channel signal, a power of a ghost signal, and a signal vs. noise ratio;

a memory updating and storing the previously-detected state signals and the a new state signal;

a direction controller attaining the control signal for controlling a the direction of the antenna by comparing new state signals of the detection part to the previous state signals stored in the memory; and

an interface part connected between the antenna and the direction controller and providing the antenna with the control signal so as to control the direction of the antenna in accordance with the control signal,

wherein the direction controller comprises:

a signal power tracker tracking a power of the tuned channel signal using an output signal of a signal power detector;

a ghost power tracker tracking a power of the ghost signal using an output signal of a ghost power detector;

a signal vs. noise ratio (SNR) tracker tracking the signal vs. noise ratio using an output of a signal vs. noise ratio calculator;

a tracking processor tracking states of the tuned channel signal using output signals of the trackers in a presently-selected antenna pattern and then changing the antenna pattern in order stored in the memory if the tracked states fail to maintain effective value sizes;

a scan processor attaining an effective signal power and antenna pattern by varying the directionality of the antenna using an output signal of the tracking processor and then storing the power and pattern values in the memory; and

a sort processor aligning the stored antenna pattern values in order of the signal power values.

6. (Currently Amended) The digital television receiver of claim 5, wherein the signal of the predetermined form is a VSB (Vestigial Side Band) signal.

7. (Currently Amended) The digital television receiver of claim 6, wherein the signal processing part ~~comprising~~ comprises:

a tuner tuning a wanted channel signal from channel signals received through the antenna;

an intermediate frequency automatic gain control part controlling automatically an intermediate frequency gain of the channel signal tuned by the tuner; and

a VSB receive chip taking a VSB signal from an output signal of the intermediate frequency automatic gain control part and providing the detection part with the VSB signal.

8. (Currently Amended) The digital television receiver of claim 7, wherein the VSB receive chip ~~comprising~~ comprises:

an automatic gain control part controlling a gain of an output signal of the intermediate frequency automatic gain control part;

a timing and carrier restoration part restoring a timing and carrier loss on an output signal of the automatic gain control part;

an equalizer equalizing an output signal of the timing and carrier restoration part;

a phase tracker tracking a phase of an output signal of the equalizer; and

a forward error corrector correcting a forward error on an output signal of the phase tracker and outputting the VSB signal.

9. (Currently Amended) ~~The digital television receiver of claim 8, A~~
digital television receiver comprising:

an antenna having a directionality according to a control signal;

a signal processing part making a digital television channel signal from the antenna have a signal of a predetermined form;

a detection part attaining state signals from an output signal of the signal processing part, wherein the state signals include a power of the channel signal, a power of a ghost signal, and a signal vs. noise ratio;

a memory updating and storing previously-detected state signals and a new state signal;

a direction controller attaining control signal for controlling the direction of the antenna by comparing new state signals of the detection part to the previous state signals stored in the memory; and

an interface part connected between the antenna and the direction controller and providing the antenna with the control signal so as to control the direction of the antenna in accordance with the control signal,

wherein the signal of the predetermined form is a VSB (Vestigial Side Band) signal,

wherein the signal processing part comprises:

a tuner tuning a wanted channel signal from channel signals received through the antenna;

an intermediate frequency automatic gain control part controlling automatically an intermediate frequency gain of the channel signal tuned by the tuner; and

a VSB receive chip taking a VSB signal from an output signal of the intermediate frequency automatic gain control part and providing the detection part with the VSB signal,

wherein the VSB receive chip comprises:

an automatic gain control part controlling a gain of an output signal of the intermediate frequency automatic gain control part;

a timing and carrier restoration part restoring a timing and carrier loss on an output signal of the automatic gain control part;

an equalizer equalizing an output signal of the timing and carrier restoration part;

a phase tracker tracking a phase of an output signal of the equalizer; and

a forward error corrector correcting a forward error on an output signal of the phase tracker and outputting the VSB signal, and

wherein the detection part ~~comprising~~ comprises:

a signal power detector detecting a power of the tuned channel signal using an automatic gain control signal from the automatic gain control part of the VSB receive chip;

a ghost power detector detecting a power of a ghost signal using an output signal from the equalizer or an output signal of the timing and carrier restoration part of the VSB receive chip; and

a signal vs. noise ratio (SNR) calculator calculating a ratio between a signal and a noise using an output signal of the phase tracker of the VSB receive chip.

10. (Currently Amended) The digital television receiver of claim 9, wherein the ghost signal power detector ~~comprising~~ comprises :

a data segment synchronization correlative calculating a correlation value between an I channel signal received from the VSB receive chip and a previously-set synchronization signal value (~~cf. a synchronization value "1001" is inserted into each data segment in a VSB transmission system~~);

a segment integrator accumulating output values of the data segment synchronization correlative in 832 delayers;

a slicer providing an increased count value when the accumulated correlation value reaches a predetermined size;

a confidence counter increasing a count number according to the increased count value; and

a maximum ghost power detection controller transferring a ghost power ready signal and a standardization value resulted from standardizing a maximum ghost power into a power of a received channel signal to the direction controller when a value of the confidence counter reaches a reference value.

11. (Original) The digital television receiver of claim 10, wherein, in the VSB transmission system, a synchronization signal inserted into each data segment is "1001".

12. (Currently Amended) The digital television receiver of claim 9, wherein the signal vs. noise ratio calculator ~~comprising~~ comprises :

a subtractor subtracting a demodulated signal constellation from a decision signal constellation;

a squarer squaring an output of the subtractor;

an accumulator accumulating output signals of the squarer;

a latch delaying an output of the accumulator; and

a divider dividing an output of the latch into a window size m of the segment integrator of the ghost signal power detector.

13. (Currently Amended) The digital television receiver of claim 12, wherein the signal vs. noise ratio is attained by the following algorithms: a signal vs. noise ratio $SNR = 10\log(P_s/P_n)$; and $P_n = \frac{1}{m} \sum_{k=1}^m P_n(k)$, where P_s is a signal power(=1), P_n is a noise power $\{P_n(k)\}$ ($P_n(k)$), 'R_1' and 'D_1' are a demodulated signal constellation(received constellation) and a decided signal constellation(decision constellation), respectively, and 'm' designates a window size of the integrator.

14. (Original) The digital television receiver of claim 8, wherein an automatic gain control (AGC) system of the tuned channel signal controls a gain of an intermediate frequency signal through a electric charge pump & lag filter from the VSB receive chip and a gain of a high frequency signal automatically using an automatic gain control signal delayed in the intermediate frequency automatic gain control part.

15. (Original) The digital television receiver of claim 8, wherein the intermediate frequency signal and high frequency signal gains are controlled

automatically by the VSB receive chip in accordance with an automatic gain control system.

16. (Canceled)

17. (Currently Amended) The digital television receiver of claim ~~16~~ 5, wherein the direction controller makes the scan processor carry out the scanning again if it is judged that there is no antenna pattern having an effective size in the memory by the operation of the tracking processor.

18. (Currently Amended) The digital television receiver of claim ~~16~~ 5, wherein the direction controller further ~~comprising~~ comprises general registers including a pointer register representing an address of the memory, a direction register ~~Dir_reg~~, always storing the present antenna state value, an angle register storing temporarily a state value of the antenna, and a power register storing a power value of a received signal temporarily.

19-22. (Canceled)